What is claimed is:

1. An isolated nucleic acid fragment encoding a soybean *myo*-inositol 1-phosphate synthase.

2. The nucleic acid fragment of Claim 1 wherein the nucleotide sequence encoding the soybean *myo*-inositol 1-phosphate synthase is substantially similar to the nucleotide sequence set forth in a member selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:15.

3. The nucleic acid fragment of Claim 1 wherein the nucleotide sequence encoding the soybean *myo*-inositol 1-phosphate synthase encodes the amino acid sequence set forth in a member selected from the group consisting SEQ ID NO:2 and SEQ ID NO:16.

4. The nucleic acid fragment of Claim 1 wherein the nucleotide sequence encoding the soybean *myo*-inositol 1-phosphate synthase is set forth in a member selected from the group consisting SEQ ID NO:1 and SEQ ID NO:15.

5. A chimeric gene comprising the nucleic acid fragment of Claim 1 or the complement of the nucleic acid fragment of Claim 1, operably linked to suitable regulatory sequences.

6. A chimeric gene comprising a subfragment of the nucleic acid fragment of Claim 1 or the complement of a subfragment of the nucleic acid fragment of Claim 1, operably linked to suitable regulatory sequences, wherein expression of the chimeric gene results in a decrease in expression of an endogenous or native gene encoding a soybean *myo*-inositol 1-phosphate synthase.

7. An isolated nucleic acid fragment encoding a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-inositol-1-phospate.

8. The nucleic acid fragment of Claim 7 wherein the nucleotide sequence encoding the nutant *myo*-inositol 1-phosphate synthase is substantially similar to the nucleotide sequence set forth in a member selected from the group consisting SEQ ID NO:5 and SEQ ID NO:11.

9. The nucleic acid fragment of Claim 7 wherein the nucleotide sequence encoding the mutant *myo*-inositol 1-phosphate synthase encodes the amino acid sequence set forth in a member selected from the group consisting SEQ ID NO:6 and SEQ ID NO:12.

10. The nucleic acid fragment of Claim 7 wherein the nucleotide sequence encoding the mutant *myo*-inositol 1-phosphate synthase is set forth in a member selected from the group consisting SEQ ID NO:5 and SEQ ID NO:11.

11. A soybean plant with a heritable phenotype of (i) a seed phytic acid content of less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less

than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g, provided that the plant is not LR33.

12. The soybean plant of Claim 11 wherein the soybean plant is homozygous for a genetic defect at the Mips1 locus.

13. The soybean plant of Claim 12 wherein the soybean plant bears ATCC Accession No. 97971.

14. The soybean plant of Claim 12 wherein the soybean plant bears ATCC Accession No. XXXXX.

15. The soybean plant of Claim 12 wherein the soybean plant bears ATCC Accession No. YYYYY.

16. The soybean plant of Claim 12 wherein the soybean plant bears ATCC Accession No. ZZZZZ.

17. The soybean plant of Claim 11 wherein the soybean plant is homozygous for at least one gene encoding a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-nositol 1-phosphate.

18. The soybean plant of Claim 17 comprising the nucleic acid fragment of Claim 7.

19. Seeds of the soybean plant of Claim 11.

20. A soybean plant comprising the chimeric gene of Claim 5 or Claim 6 wherein the soybean plant has a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g.

21. Seeds of the soybean plants of Claim 20.

22. A method for making a soybean plant with a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g, the method comprising:

(a) crossing LR33 or the soybean plant of Claim 11 with an elite soybean plant; and

(b) selecting a progeny plant of the cross of step (a) that has a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g.

23. Seeds of the soybean plant made by the method of Claim 22.

24. A method for making a soybean plant with a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g, the method comprising:

(a) crossing the soybean plant of Claim 20 with an elite soybean plant; and

(b) selecting progeny plant of the cross of step (a) that has a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g.

25. Seeds of the soybean plant made by the method of Claim 24.

26. A soy protein product derived from seeds of a soybean plant homozygous for at least one gene encoding a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-inositol 1-phosphate, the gene conferring a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g.

27. A soy protein product derived from the processing of soybean seeds of Claim 19.

28. A soy protein product derived from the processing of soybean seeds of Claim 21.

29. A soy protein product derived from the processing of soybean seeds of Claim 23.

30. A soy protein product derived from the processing of soybean seeds of Claim 25.

31. A method for making a soy protein product derived from seeds of a soybean plant with a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g comprising:

(a) crossing an agronomically elite soybean plant with LR33 or the soybean plant of Claim 11;

(b) screening the seed of progeny plants obtained from step (a) for (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g; and

(c) processing the seed selected in step (b) to obtain the desired soybean protein product.

32. A method for producing a soy protein product derived from seeds of a soybean plant with a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g comprising:

(a) crossing an agronomically elite soybean plant with the soybean plant of Claim 20;

(b) screening the seed of progeny plants obtained from step (a) for (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g; and

(c) processing the seed selected in step (b) to obtain the desired soybean protein product.

33. A method of using a soybean plant homozygous for at least one gene encoding a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-inositol 1-phosphate, the gene conferring a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g to produce progeny lines, the method comprising:

(a) crossing a soybean plant comprising a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-inositol 1-phosphate with any soybean parent which does not comprise the mutation, to yield a F1 hybrid;

(b) selfing the F1 hybrid for at least one generation; and

(c) identifying the progeny of step (b) homozygous for at least one gene encoding a mutant *myo*-inositol 1-phosphate synthase having decreased capacity for the synthesis of *myo*-inositol 1-phosphate, the gene conferring a heritable phenotype of (i) a seed phytic acid content less than 17 μmol/g, (ii) a seed content of raffinose plus stachyose of less than 14.5 μmol/g, and (iii) a seed sucrose content of greater than 200 μmol/g.